Gigabit eco-friendly Ethernet Switch

AT-GS900/8

Installation Guide

Allied Telesis™

Electrical Safety and Emissions Standards

This product meets the following standards.

U.S. Federal Communications Commission

Declaration of Conformity

Manufacturer Name: Allied Telesis, Inc.

Declares that the product: **Gigabit Ethernet Switch**

Model Numbers: **AT-GS900/8**

This product complies with FCC Part 15B, Class B Limits:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device must not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Radiated Energy

Note: This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with instructions, may cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on. The user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and the receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission rules.

Industry Canada

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

European Union Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment

This Allied Telesis RoHS-compliant product conforms to the European Union Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment.   Allied Telesis ensures RoHS conformance by requiring supplier Declarations of Conformity, monitoring incoming materials, and maintaining manufacturing process controls.

RFI Emissions	FCC Part 15 Class B CISPR 22 Class B EN55022 Class B: 2006+A1:2007
Immunity	EN55024
Electrical Safety	UL – USA (UL60950-1) LVD (EN60950-1, 2nd edition) CSA or cUL – Canada C-Tick – Australia CE Mark

Translated Safety Statements

Important: The ☞ symbol indicates that a translation of the safety statement is available in a PDF document titled "Translated Safety Statements". This is posted on the Allied Telesis website at **http://www.alliedtelesis.com/support/software/**. Refer to "Where to Find Web-based Product Documentation" on page 13 to navigate to this document.

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Preface

This guide contains instructions on how to install the AT-GS900/8 Gigabit eco-friendly Ethernet Switch. This preface contains the following sections:

❐ "Safety Symbols Used in this Document" on page 12

❐ "Where to Find Web-based Product Documentation" on page 13

❐ "Contacting Allied Telesis" on page 14

Safety Symbols Used in this Document

This document uses the safety symbols defined in Table 1.

Table 1. Safety Symbols

Symbol	Meaning	Description
⚠	Caution	Performing or omitting a specific action may result in equipment damage or loss of data.
⚡	Warning	Performing or omitting a specific action may result in electrical shock.

Where to Find Web-based Product Documentation

The product documentation for all Allied Telesis products are available in portable document format (PDF) on our web site. Go to **http://www.alliedtelesis.com/support/software/**.

Enter your hardware product model in the **Search by Product Name** field; for example, enter AT-GS900/8. You can view the documents online or download them onto your local workstation or server.

Contacting Allied Telesis

This section provides Allied Telesis contact information for technical support as well as sales and corporate information.

Online Support
You can request technical support online by accessing the Allied Telesis Knowledge Base: **www.alliedtelesis.com/support/kb.aspx**. You can use the Knowledge Base to submit questions to our technical support staff and review answers to previously asked questions.

Email and Telephone Support
For Technical Support via email or telephone, refer to the Support & Services section of the Allied Telesis web site: **www.alliedtelesis.com**. Select your country from the list displayed on the website. then select the appropriate menu tab.

Returning Products
Products for return or repair must first be assigned a return materials authorization (RMA) number. A product sent to Allied Telesis without an RMA number will be returned to the sender at the sender's expense.

To obtain an RMA number, contact the Allied Telesis Technical Support group at our web site: **www.alliedtelesis.com/support/rma**. Select your country from the list displayed on the website. Then select the appropriate menu tab.

Sales or Corporate Information
You can contact Allied Telesis for sales or corporate information through our web site: **www.alliedtelesis.com**. To find the contact information for your country, select Contact Us -> Worldwide Contacts.

Warranty
Go to **www.alliedtelesis.com/support/warranty** for specific terms and conditions of the warranty and for warranty registration for the AT-GS900/8 switch.

Management Software Updates
New releases of management software for our managed products are available on our Allied Telesis web site at **www.alliedtelesis.com/support/software**.

Go to "Where to Find Web-based Product Documentation" on page 13 for instructions on navigating to this information.

Chapter 1
Product Description

The AT-GS900/8 Gigabit eco-friendly Ethernet Switch is a low operating power, unmanaged, Layer 2 switch designed to simplify the task of creating or expanding an Ethernet, Fast Ethernet, or Gigabit Ethernet network.

This chapter contains the follows sections:

Features

The AT-GS900/8 features include:

❒ Silent fanless operation

❒ Power saving port features on each port including:

  – Cable Length detection and power minimization

  – Link-Down power savings

❒ LED disable mode

❒ 8 x 10/100/1000Mbps auto-sensing, switching ports

❒ Up to 8K MAC address table

❒ Packet Buffer - 1 Mb

❒ Back pressure for half-duplex operation

❒ IEEE 802.3x flow control for full duplex operation

❒ Support for Jumbo Frames up to 9216 Bytes

❒ Wire speed performance

❒ Non-blocking architecture

❒ Auto-negotiation Gigabit ports

❒ Auto MDI/MDI-X

❒ Transparent to VLAN tagged packets

❒ Rack Mount Brackets able to turn 90 degrees for Wall mount

❒ 1U chassis high

❒ Internal power supply

Components

Figure 1 illustrates the front panel of the AT-GS900/8 switch.
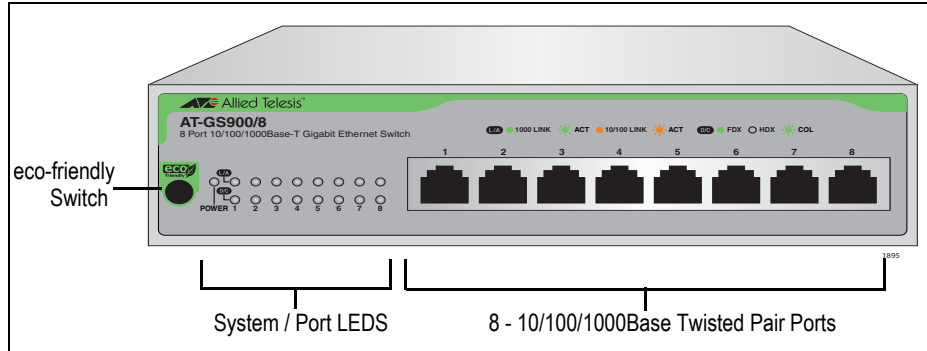
Figure 1. Front Panel

Figure 2 illustrates the back panel of the AT-GS900/8 switch.
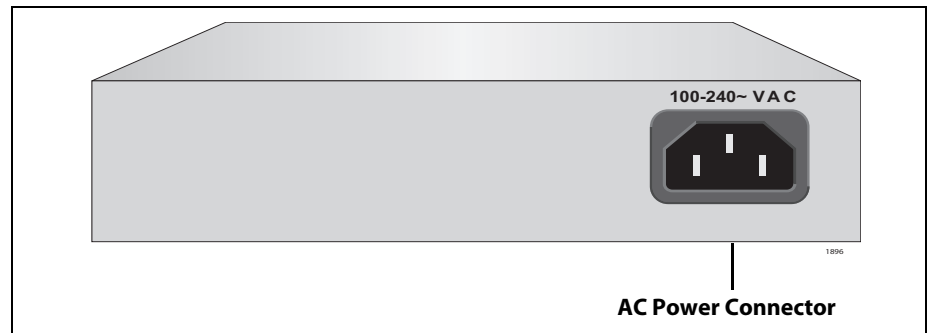
Figure 2. Back Panel

Hardware Feature Description

The following sections describe hardware features of the AT-GS900/8 Gigabit eco-friendly Ethernet Switch:

❒ System and Port LEDs

❒ Twisted Pair Ports

❒ AC Power Connector

Twisted Pair Ports

The AT-GS900/8 switch features 8 twisted pair ports.

Type of Connector

The twisted pair ports feature 8-pin RJ-45 connectors. (For the port pinouts, refer to "RJ-45 Twisted Pair Port Connectors" on page 44.)

Speed

Each port is 10/100/1000Base-T compliant and is capable of 10, 100, or 1000 Mbps speed, respectively. The ports are IEEE 802.3u Auto-Negotiation compliant. With Auto-Negotiation, the switch automatically matches the highest possible common speed between each switch port and its respective end-node. For example, if an end-node is capable of only 10 Mbps, the switch sets the port connected to the end-node to 10 Mbps.

Duplex Mode

Each twisted pair port on the switch can operate in either half- or full duplex mode. The twisted pair ports are IEEE 802.3u-compliant and will Auto-Negotiate the duplex mode setting.

Note
For the switch to set the duplex mode for each port correctly, the end-nodes that you connect to the switch ports should also use Auto-Negotiation. Otherwise, a duplex mode mismatch can occur, affecting network performance. For further information, refer to "Duplex Mode" on page 23.

Maximum Distance

Each twisted pair port has a maximum operating distance of 100 meters (328 feet).

Type of Cabling

For 10 Mbps operation, Category 3 or better 100 ohm shielded or unshielded twisted pair cabling is required. For 100 or 1000 Mbps operation, Category 5 and Enhanced Category 5 (5E) 100 ohm shielded or unshielded twisted pair cabling is required.

Auto MDI/MDI-X

All of the ports on the switch are auto-MDI and IEEE 802.3ab-compatible. Since each port's speed and duplex mode are set through Auto-Negotiation, the port uses the auto-MDI feature to automatically configure itself as MDI or MDI-X when connected to an end-node. Consequently, you can use either a straight-through or crossover twisted pair cable when connecting any network device to a port.

Green Power Saving Ports

All Ethernet ports support the power saving functions including Link-Down and Cable Length power savings. The greatest power savings occur when all 8 ports' linked status is down and the ports are inactive. The switch uses the most power when all 8 ports are linked up to via Ethernet cables that are the maximum length or 100 meters.

When a link is not established on an individual port, the switch controller automatically reduces the power supplied to the port's circuitry to an idle level. The greater the number of ports that are not linked up results in a greater cumulative power savings for the switch.

When a link is established on an individual port, the power provided to the PHY circuitry is based on the length of the Ethernet cable that you connect to the port. Full power is provided to the port's circuitry if the cable length is detected to be the maximum specified cable length or 100 m. If the cable length is shorter than this, the switch senses the cable length and reduces the available port power in proportion to the detected cable length. This feature provides power efficiencies for the port even when it is actively linked to another network device.

eco-friendly Switch   The eco-friendly switch on the front panel is shown in Figure 3. It may be used to enable all the port LEDs (out position) or conserve power by disabling the port LEDs (in position). The switch functions are described in Table 2.

Figure 3. eco-friendly Switch

Table 2.   eco-friendly Switch Functions

Action	Results
Off (Out position)	All front panel LEDs are enabled.
On (In position)	All front panel LEDs are disabled for power conservation with the exception of the POWER LED, which remains active at all times.

LEDs   The system and port LEDs on the front panel of the AT-GS900/8 switch displays the switch and its port status information. See Figure 4. Each port has two LEDs.
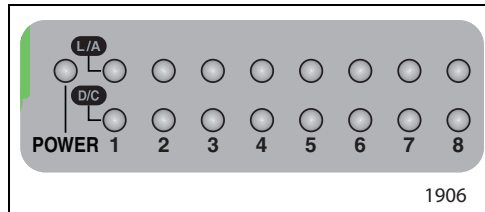

Figure 4. Port LEDs

Table 3 describes the system and port LEDs on the AT-GS900/8 switch.

Table 3. System and Port LEDs

LED	State	Description
POWER	Green	The switch is powered ON and operating normally.
	OFF	The switch has no power.
L/A	Solid Green	A valid 1000 Mbps link is established on the port.
	Solid Orange	A valid 10 or 100 Mbps link is established on the port.
	Blinking Green	A 1000 Mbps packet transmission and reception is in process on the port.
	Blinking Orange	A 10/100 Mbps packet transmission and reception is in process on the port.
	OFF	No link is established on the port.
D/C	Solid Green	A full-duplex link is established on the port.
	Blinking Green	The port is experiencing a collision in half duplex mode.
	OFF	A half-duplex link is established on the port.

AC Power Connector

The AT-GS900/8 switch has a single AC power supply socket on the back panel. To power ON or OFF the switch, you connect or disconnect the power cord.

See Figure 2 on page 18 for an illustration of the back panel. For the input voltage range, refer to Appendix A, "Power Specifications" on page 42. To power ON or OFF the switch, you connect or disconnect the power cord.

Ethernet Switching Basics

An Ethernet switch interconnects network devices, such as workstations, printers, routers, and other Ethernet switches, so that they can communicate with each other by sending and receiving Ethernet frames.

MAC Address Table

Every hardware device on your network has a unique MAC address. This address is assigned to the device by the device's manufacturer. For example, when you install a Network Interface Card (NIC) in a computer so that you can connect it to the network, the NIC already has a MAC address assigned to it by its manufacturer.

The AT-GS900/8 can store up to 8000 MAC addresses in its MAC address table. Each switch uses the table to store the MAC addresses of the network end-nodes connected to the ports, along with the port number on which each address was learned.

A switch learns the MAC addresses of the end-nodes by examining the source address of each packet received on a port. It adds the address and port on which the packet was received to the MAC table (if the address has not already been entered in the table). The result is a table that contains all the MAC addresses of the devices that are connected to the switch's ports, and the port number where each address was learned.

When the switch receives a packet, it also examines the destination address and, by referring to its MAC address table, determines the port on which the destination end-node is connected. It then forwards the packet to the appropriate port and to the end-node. This increases network bandwidth by limiting each frame to the appropriate port where the intended end-node is located, freeing the other switch ports for receiving and transmitting data.

If the switch receives a packet with a destination address that is not in the MAC address table, it floods the packet to all the ports on the switch. When the destination end-node responds, the switch adds its MAC address and port number to the table.

If the switch receives a packet with a destination address that is on the same port on which the packet was received, it discards the packet without forwarding it on to any port. Since both the source end-node and the destination end-node for the packet are located on the same port on the switch, there is no reason for the switch to forward the packet.

Duplex Mode

Duplex mode refers to how an end-node receives and transmits data. If an end-node can either receive or transmit data, but not both simultaneously, the end-node is operating in what is referred to as half-duplex mode. If an

end-node can both receive and transmit data simultaneously, the end-node is said to be operating in full-duplex mode. Naturally, an end-node capable of operating in full-duplex can handle data much faster than an end-node that can only operate in half-duplex mode.

The twisted pair ports on the AT-GS900/8 switch can operate in half- or full-duplex mode for 10/100 Mbps and full-duplex for 1000 Mbps. It is IEEE 802.3u-compliant and uses Auto-Negotiation to set the duplex mode or you automatically.

Store and Forward

The AT-GS900/8 switch uses store and forward as the method for receiving and transmitting frames. When a Ethernet frame is received on a switch port, the switch does not retransmit the frame from the destination port until it has received the entire frame and stored the frame in a port buffer. It then examines the frame to determine if it is a valid frame. Invalid frames, such as fragments or runts, are discarded by the switch. This process insures that only valid frames are transmitted from the switch ports and that damaged frames are not propagated on your network.

Backpressure and Flow Control

To maintain the orderly movement of data between the end-nodes, an Ethernet switch may periodically need to signal an end-node to stop sending data. This can occur under several circumstances. For example, if two end-nodes are operating at different speeds, the switch, while transferring data between the end-nodes, might need to instruct the faster end-node to stop transmitting data to allow the slower end-node to catch up. An example of this would be when a server operating at 1000 Mbps is sending data to a workstation operating at only 100 Mbps.

How a switch signals an end-node to stop transmitting data differs depending on the duplex mode of the end-node and switch port. A twisted pair port operating in half-duplex mode stops an end-node from transmitting data by forcing a collision. A collision on an Ethernet network occurs when two end-nodes attempt to transmit data using the same data link at the same time. A collision causes an end-node to stop sending data, wait for a brief period of time, and then retransmit the same data. Once the switch is ready to receive data again, the switch stops forcing collisions. This is referred to as backpressure.

A port operating in full-duplex mode uses PAUSE frames, as specified in the IEEE 802.3x standard, to stop the transmission of data from an end-node. Whenever the switch wants an end-node to stop transmitting data, it issues this frame. The frame instructs the end-node to cease transmission for a period of time specified within the frame. The switch continues to issue PAUSE frames until it is ready again to receive data from the end-node. This is referred to as flow control.

Chapter 2
Installation

This chapter contains the following sections:

❏ "Reviewing Safety Precautions" on page 27

❏ "Planning the Installation" on page 30

❏ "Unpacking the Switch" on page 31

❏ "Installing the Switch on a Table or Desktop" on page 32

❏ "Installing the Switch on a Wall" on page 34

❏ "Installing the Switch in a Rack" on page 37

Reviewing Safety Precautions

Please review the following safety precautions before you begin to install the switch or any of its components. The ⬳ indicates that a translation of the safety statements is available in a PDF document titled "Translated Safety Statements". This other product documentation is posted on the Allied Telesis website at **http://www.alliedtelesis.com/support/software/**.

Enter your hardware product model in the **Search by Product Name** field; for example, enter AT-GS900/16 or AT-GS900/24. You can view the documents online or download them onto your local workstation or server.

Warning: To prevent electric shock, do not remove the cover. No user-serviceable parts inside. This unit contains hazardous voltages and should only be opened by a trained and qualified technician. To avoid the possibility of electric shock, disconnect electric power to the product before connecting or disconnecting the LAN cables. ⬳ E1

Warning: Do not work on equipment or cables during periods of lightning activity. ⬳ E2

Warning: To prevent electric shock, do not remove the cover. No user-serviceable parts inside. This unit contains hazardous voltages and should only be opened by a trained and qualified technician. To avoid the possibility of electric shock, disconnect electric power to the product before connecting or disconnecting the LAN cables. ⬳ E3

Warning: Do not work on equipment or cables during periods of lightning activity. ⬳ E4

Warning: Power cord is used as a disconnection device. To de-energize equipment, disconnect the power cord. ⬳ E5

Warning: Class I Equipment. This equipment must be earthed. The power plug must be connected to a properly wired earth ground socket outlet. An improperly wired socket outlet could place hazardous voltages on accessible metal parts. ⬳ E6

Pluggable Equipment. The socket outlet shall be installed near the equipment and shall be easily accessible. ⬳ E7

⚠ **Caution:** Air vents must not be blocked and must have free access to the room ambient air for cooling. ✍ E8

Warning: Operating Temperature. This product is designed for a maximum ambient temperature of 40° degrees C. ✍ E9

All Countries: Install product in accordance with local and National Electrical Codes. ✍ E10

⚠ **Warning:** Mounting of the equipment in the rack should be such that a hazardous condition is not created due to uneven mechanical loading. ✍ E27

⚠ **Warning:** Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuits (e.g., use of power strips). ✍ E37

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra). ✍ E38

Caution: Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. ✍ E39

⚠ **Caution:** The unit does not contain serviceable components. Please return damaged units for servicing. ✍ E42

Selecting a Site for the Switch

Observe the following requirements when choosing a site for your switch:

❑ If you plan to install the switch in an equipment rack, ensure that the rack is safely secured and that it will not tip over. Devices in a rack should be installed starting at the bottom, with the heavier devices near the bottom of the rack.

❑ If you are installing the switch on a table, ensure that the table is level and secure.

❑ The power outlet for the switch should be located near the unit and should be easily accessible.

❑ The site should provide for easy access to the ports on the front of the switch. This will make it easy for you to connect and disconnect cables, as well as view the switch's LEDs.

❑ To allow proper cooling of the switch, air flow around the unit and through its vents on the side and rear should not be restricted.

❑ Do not place objects on top of the switch.

❑ Do not expose the switch to moisture or water.

❑ Ensure that the site is a dust-free environment.

❑ You should use dedicated power circuits or power conditioners to supply reliable electrical power to the network devices.

Planning the Installation

Table 4 contains the cabling specifications for the twisted pair ports.

Table 4. Twisted Pair Cabling and Distances

Speed	Type of Cable	Maximum Operating Distance
10 Mbps	Category 3 or better 100-ohm shielded or unshielded twisted pair cable	100 m (328 ft)
100 Mbps	Category 5 or Category 5E (Enhanced) 100-ohm shielded or unshielded twisted pair cable	100 m (328 ft)
1000 Mbps	Category 5 and Category 5E (Enhanced) 100-ohm shielded or unshielded twisted pair cable	100 m (328 ft)

Note
The twisted pair ports on the switch feature Auto-MDI when operating at either 10, 100, or 1000 Mbps. Each port is individually configured as MDI or MDI-X when connected to an end-node. Consequently, you can use either a straight-through or crossover twisted pair cable when connecting any network device to a twisted pair port on the switch. For example, a port operating at 10 or 100 Mbps uses two pairs of twisted pair wiring while a port operating at 1000 Mbps uses four pairs of twisted pair wiring.

Unpacking the Switch

To unpack an AT-GS900/8 switch, perform the following procedure:

1. Remove all components from the shipping package.

    > **Note**
    > Store the packaging material in a safe location. You must use the
    > original shipping material if you need to return the unit to Allied
    > Telesis.

2. Place the switch on a level, secure surface.

3. Ensure the following hardware components are included in your switch
    package. If any item is missing or damaged, contact your Allied Telesis
    sales representative for assistance.

    □ One AT-GS900/8 Gigabit eco-friendly Ethernet Switch
    □ Two rack/wall mounting brackets
    □ Eight flathead Phillips screws for mounting brackets to the switch
    □ Four screws and anchors for attaching the switch to the wall
    □ Four screws for attaching the switch to the rack
    □ Four self-adhesive rubber feet
    □ AC power cord

Installing the Switch on a Table or Desktop

To install the switch on a table or desktop, perform the following procedure:

1. Remove all the items from the packaging and store the packaging material in a safe place. In the event a problem occurs and you need to return the unit, please use as much of the original shipping material as possible.

2. Attach the four self-adhesive rubber feet to the bottom of the switch, as shown in Figure 5.
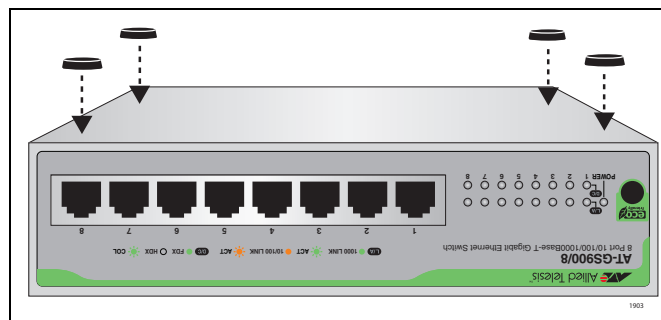

Figure 5. Attaching the Rubber Feet

3. Place the switch on a flat and secure surface, leaving ample space around the switch for ventilation.

4. Connected the twisted pair cables to the twisted pair ports.

   When connecting a twisted pair cable to a port, observe the following guidelines:

   ❒ An RJ-45 connector should fit snugly into the port on the switch. The tab on the connector should lock the connector into place.

   ❒ Check that you are using the appropriate type of twisted pair cabling. Refer to "Twisted Pair Cabling and Distances" on page 30 for twisted pair cable specifications.

   ❒ Since the twisted pair port, when operating in Auto-Negotiation, is Auto MDI/MDI-X, you can use either a straight-through or crossover twisted pair cable to connect any type of network device to a port on the switch. If you disable Auto-Negotiation on the port, the port defaults to MDI-X.

5. Apply AC power to the switch by plugging the power cord into the AC power connector on the back panel of the unit, as illustrated in Figure 6.
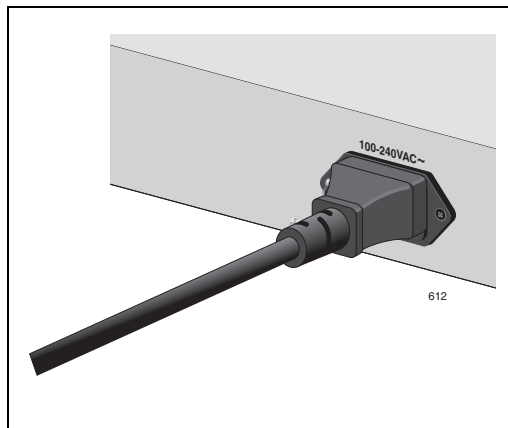

Figure 6. Connecting the AC Power Connector to Switch

6. Plug the other end or the power cord into a wall outlet.

7. Verify that the POWER LED is green. If the LED is OFF, refer to "Troubleshooting" on page 41 for instructions.

> **Note**
> The switch perform a self-diagnostic test upon power up. This takes about 20 seconds to complete.

8. Power ON the end-nodes connected to the switch.

9. Check that all the L/A LEDs are green or blinking green for the ports connected to end-nodes. If any of the LEDs are OFF, refer to "Troubleshooting" on page 41 for instructions.

The switch is now ready for use.

Installing the Switch on a Wall

To install the switch on a wall, perform the following procedure:

1. Remove all the items from the packaging and store the packaging material in a safe place. In the event a problem occurs and you need to return the unit, please use as much of the original shipping material as possible.

2. Attach the two rackmounting brackets (provided) to the sides of the switch using the eight flathead Phillips screws (provided), as illustrated in Figure 7.
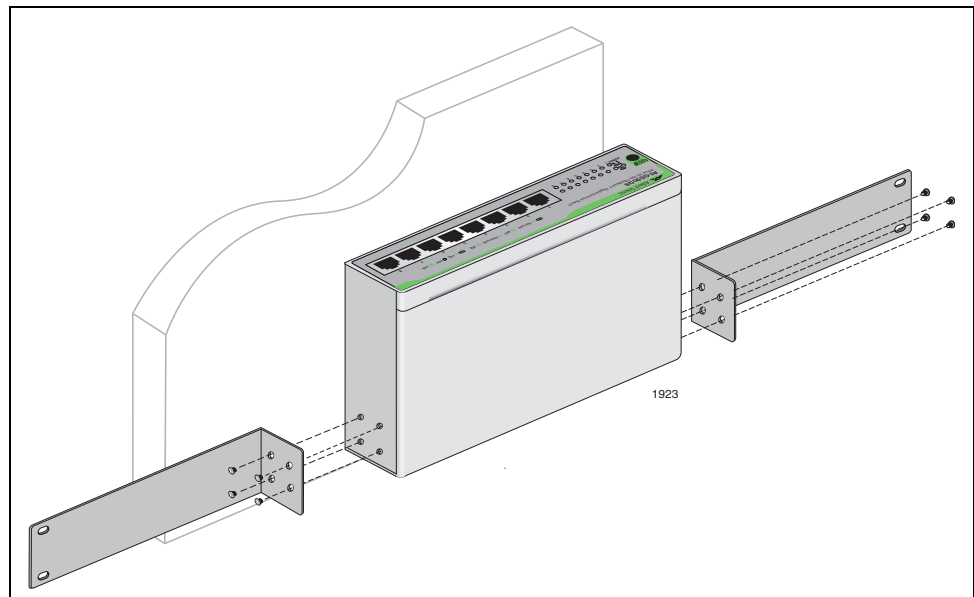

Figure 7. Attaching the brackets to the sides of the switch

3. Place the switch on the wall. Then mount the switch using the plastic anchors and screws which are shipped with the product. See Figure 8 on page 35.

⚠️ **Warning**
The switch must be mounted with the AC Power Connector facing down to conform with UL requirements as shown in Figure 8 on page 35.
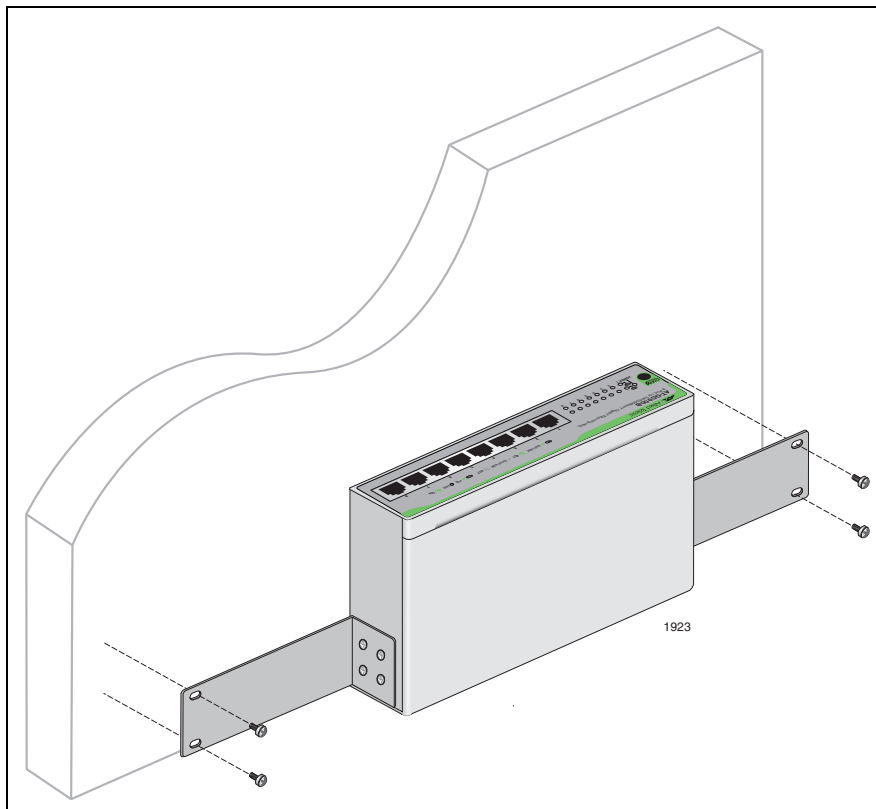
Figure 8. Attaching the switch to the wall

4. Connected the twisted pair cables to the twisted pair ports.

   When connecting a twisted pair cable to a port, observe the following guidelines:

   ❒ An RJ-45 connector should fit snugly into the port on the switch. The tab on the connector should lock the connector into place.

   ❒ Check that you are using the appropriate type of twisted pair cabling. Refer to "Twisted Pair Cabling and Distances" on page 30 for twisted pair cable specifications.

   ❒ Since the twisted pair port, when operating in Auto-Negotiation, is Auto MDI/MDI-X, you can use either a straight-through or crossover twisted pair cable to connect any type of network device to a port on the switch. If you disable Auto-Negotiation on the port, the port defaults to MDI-X.

5. Apply AC power to the switch by plugging the power cord into the AC power connector on the back panel of the unit, as illustrated in Figure 6 on page 33.

6. Plug the other end or the power cord into a wall outlet.

7. Verify that the POWER LED is green. If the LED is OFF, refer to "Troubleshooting" on page 41 for instructions.

    > **Note**
    > The switch perform a self-diagnostic test upon power up. This takes about 20 seconds to complete.

8. Power ON the end-nodes connected to the switch.

9. Check that all the L/A LEDs are green or blinking green for the ports connected to end-nodes. If any of the LEDs are OFF, refer to "Troubleshooting" on page 41 for instructions.

The switch is now ready for use.

Installing the Switch in a Rack

Perform the following procedure to install the switch in a standard 19-inch rack. If you are not installing the switch in a rack, go to the next procedure.

1. Place the unit upside down on a level, secure surface.

2. If they have been previously installed, remove the self-adhesive rubber feet from the bottom of the switch, as shown in Figure 9 using a flat-head screwdriver.
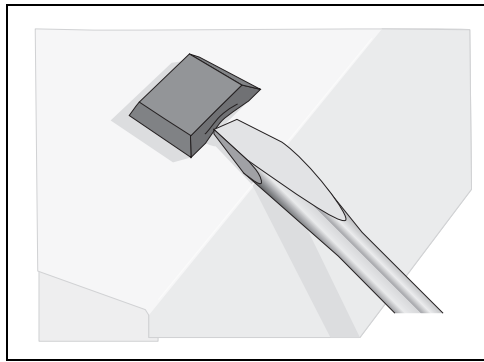

Figure 9. Removing the Feet

3. Turn the switch over.

4. Attach the two rackmounting brackets (provided) to the sides of the switch using the eight flathead Phillips screws (provided), as illustrated in Figure 10.
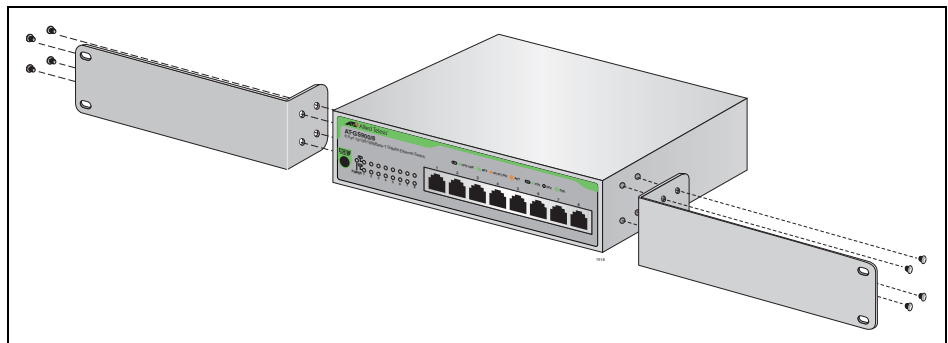

Figure 10. Attaching Rack Mounting Brackets

5. Mount the switch in the 19-inch rack using the #10-32 Phillips screws which are shipped with the product, as illustrated in Figure 11.
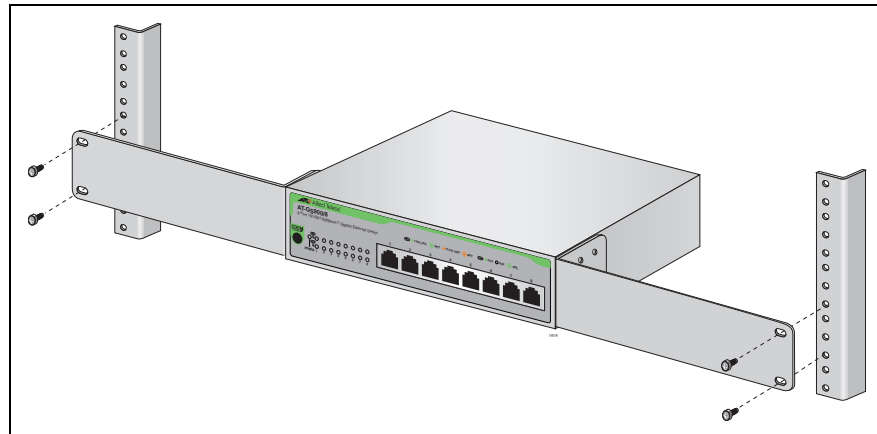

Figure 11. Rack Mounting the Switch

6. Connected the twisted pair cables to the twisted pair ports.

    When connecting a twisted pair cable to a port, observe the following guidelines:

    ❐ An RJ-45 connector should fit snugly into the port on the switch. The tab on the connector should lock the connector into place.

    ❐ Check that you are using the appropriate type of twisted pair cabling. Refer to "Twisted Pair Cabling and Distances" on page 30 for twisted pair cable specifications.

    ❐ Since the twisted pair port, when operating in Auto-Negotiation, is Auto MDI/MDI-X, you can use either a straight-through or crossover twisted pair cable to connect any type of network device to a port on the switch. If you disable Auto-Negotiation on the port, the port defaults to MDI-X.

7. Apply AC power to the switch by plugging the power cord into the AC power connector on the back panel of the unit, as illustrated in Figure 6 on page 33.

8. Plug the other end or the power cord into a wall outlet.

9. Verify that either the POWER LED is green. If the LED is OFF, refer to "Troubleshooting" on page 41 for instructions.

    Note
    The switch perform a self-diagnostic test upon power up. This takes about 20 seconds to complete.

10. Power ON the end-nodes connected to the switch.

11. Check that all the L/A LEDs are green or blinking green for the ports connected to end-nodes. If any of the LEDs are OFF, refer to "Troubleshooting" on page 41 for instructions.

The switch is now ready for use.

Chapter 3
Troubleshooting

This chapter contains information on how to troubleshoot the switch in the event that a problem occurs.

> **Note**
> If you are still unable to resolve the problem after following the instructions in this chapter, contact ATI Technical Support for assistance. Refer to "Contacting Allied Telesis" on page 14.

Check the POWER LED on the front of the switch. If the LED is OFF, indicating that the unit is not receiving power, do the following:

❒ Ensure that the power cord is securely connected to the power source and to the AC connector on the back panel of the switch.

❒ Verify that the power outlet has power by connecting another device to it.

❒ Connect the unit to another power source.

❒ Use a different power cord.

❒ Verify that the voltage from the power source is within the required levels for your region.

Verify that the L/A LEDs are green or blinking green for the ports connected to end-nodes. If a L/A LED is OFF, do the following:

❒ Verify that the end-node connected to the port is powered ON and is operating properly.

❒ Verify that the twisted pair cable is securely connected to the port on the switch and to the port on the end-node.

❒ Ensure that the twisted pair cable does not exceed 100 meters (328 feet).

❒ Verify that you are using the appropriate category of twisted pair cable: Category 3 or better for 10 Mbps operation and Category 5 and Category 5E for 100 and 1000 Mbps operation.

❒ Verify that the eco friendly switch is in the "Out" position.

> **Note**
> A 1000Base connection can take from five to ten seconds for the link to be established.

Appendix A
Technical Specifications

Physical Specifications

Dimensions:	(W x D x H)
AT-GS900/8	12.1 cm x 18.4 cm x 4.4 cm
	(4.7 in x 7.2 in x 1.7 in)
Weight:	
AT-GS900/8	0.766kg (1.7 lbs)

Environmental Specifications

Operating Temperature:	0° C to 40° C (32° F to 104° F)
Storage Temperature:	-25° C to 70° C (-13° F to 158° F)
Operating Humidity:	5% to 90% non-condensing
Storage Humidity:	5% to 95% non-condensing
Operating Altitude Range:	Up to 10,000 feet (3,048 meters)

Power Specifications

Power Consumption:	
AT-GS900/8	4.33 watts maximum
AC Input Electrical Ratings:	
AT-GS900/8	100 - 240 V AC, 0.22 A
Frequency:	50/60 Hz

Safety and Electromagnetic Emissions Certifications

EMI	FCC Part 15 Class B
	CISPR 22 Class B
	EN55022 Class B: 2006+A1:2007
Immunity	EN55024
Safety	UL - USA (UL60950-1)
	LVD (EN60950-1, 2nd edition)
	CSA or $_C$UL - Canada
	C-Tick - Australia
	CE Mark
Environment Compliance	Eu-RoHS compliant
	China RoHS compliant
	WEEE
Quality and Reliability:	AT-GS900/8 MTBF: > 250,000 hours

Compliance Standards

IEEE 802.3 – 10Base-T

IEEE 802.3u – 100Base-TX

IEEE 802.3ab – 1000Base-TX Gigabit Ethernet

IEEE 802.3x – Flow Control, Symmetric and Asymmetric

RJ-45 Twisted Pair Port Connectors

This section lists the connectors and connector pinouts for the AT-GS900/8 Fanless Gigabit Ethernet Switch and their components.

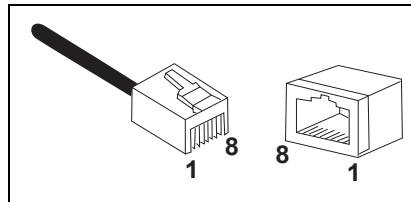Figure 12 illustrates the pin layout to an RJ-45 connector and port.

Figure 12. RJ-45 Connector and Port Pin Layout

Table 5 lists the RJ-45 pin signals when a twisted pair port is operating in the MDI configuration.

Table 5. MDI Pin Signals (10Base-T or 100Base-TX)

Pin	Signal
1	TX+
2	TX-
3	RX+
6	RX-

Table 6 lists the RJ-45 port pin signals when a twisted pair port is operating in the MDI-X configuration.

Table 6. MDI-X Pin Signals (10Base-T or 100Base-TX)

Pin	Signal
1	RX+
2	RX-
3	TX+
6	TX-

Table 7 lists the RJ-45 connector pins and their signals when a

1000Base-T port is operating at 1000 Mbps.

Table 7. RJ-45 1000Base-T Connector Pinouts[a]

Pin	Pair	Signal
1	1	TX and RX+
2	1	TX and RX-
3	2	TX and RX+
4	3	TX and RX+
5	3	TX and RX-
6	2	TX and RX-
7	4	TX and RX+
8	4	TX and RX-

a. Bi-directional data on each pair.